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(54) Abstract Title
Ventilator grill

(57) A ventilator grill comprises a front panel formed with a plurality of ventilation openings and a rear panel formed over its entire surface with a plurality of discrete openings. Lands between the ventilation openings of the front panel are coated or covered on their inner faces with intumescent material. The rear panel may be in the form of a wire mesh. Utility is in the prevention of passage of smoke through openings in walls or panels.

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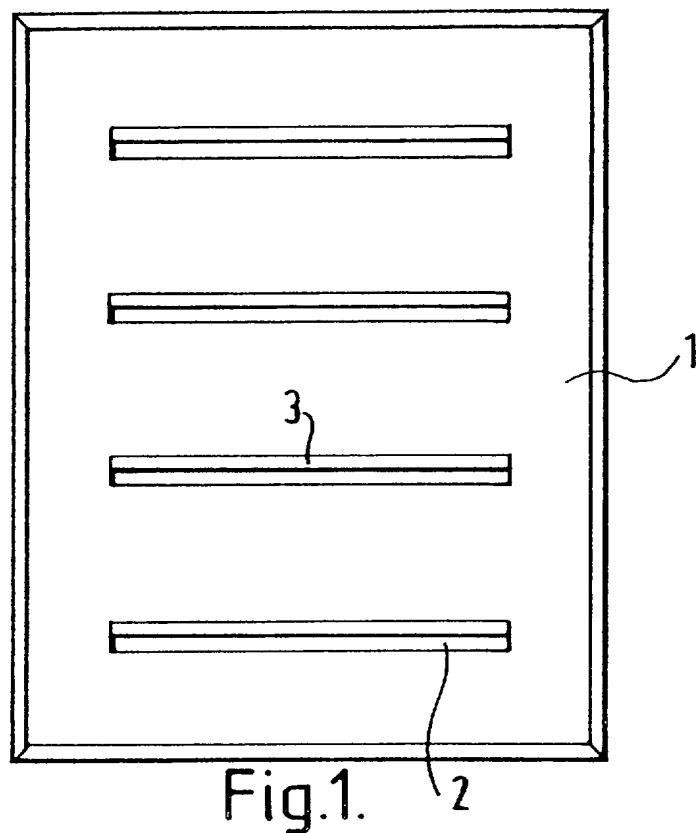


Fig.1.

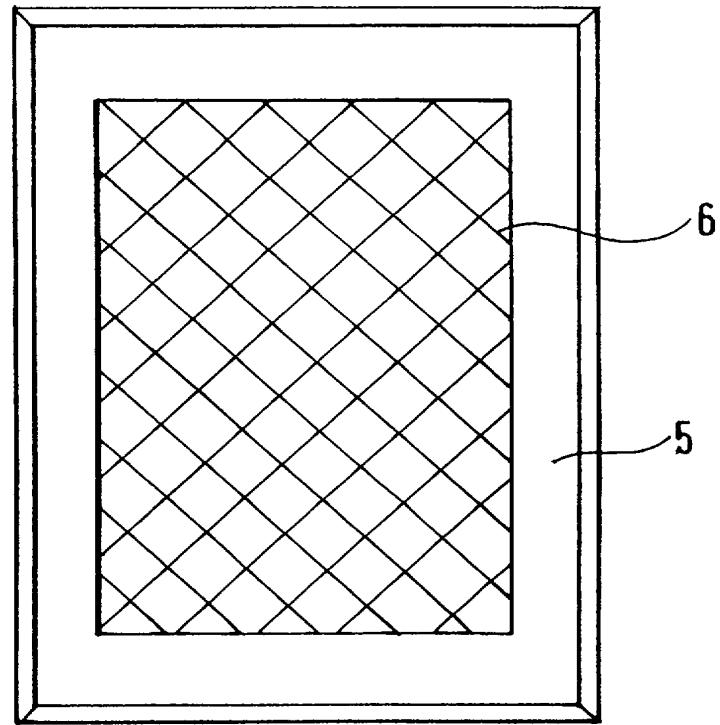


Fig.2.

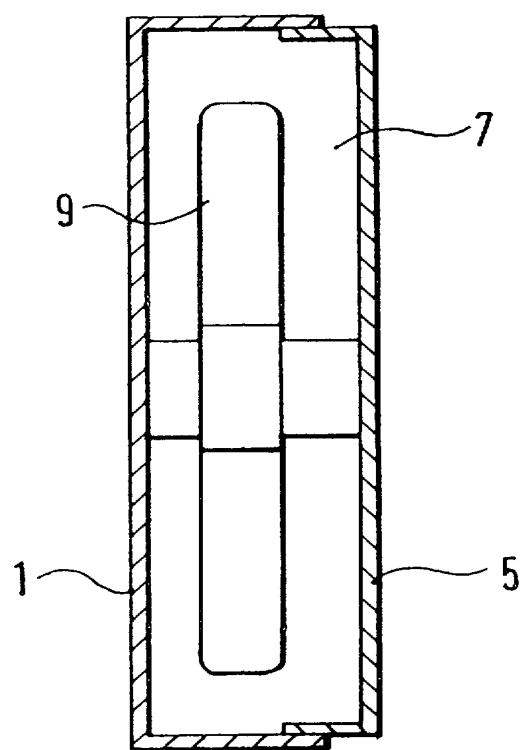


Fig.3.

VENTILATOR GRILLS

This invention relates to ventilator grills and more especially to ventilator grills which operate automatically to prevent the passage of smoke through an opening in a wall or panel.

Ventilator grills which include suitably positioned layers or pieces of intumescent material which expand under the action of heat to close the grill openings to provide a smoke and/or fireproof barrier are well known. A disadvantage of many such grills is an inability to prevent the flow of smoke and/or flames for more than a limited period of time, for example thirty minutes. On many occasions, this period of time is insufficient to provide efficient vacation of people from an area of a building subjected to smoke and flames.

One important criterion for determining the fire and/or smoke worthiness of a ventilator grill is the period of time during which the integrity of the mass of intumesced material is maintained. Typically, the accumulated mass of intumescent material behind a grill tends to fracture in the presence of fire after a period of about 30 minutes. As openings appear in the intumescent material, so flames and smoke pass from one side of the grill to the other to the detriment of the safety of personnel within the building.

The present invention sets out to provide a ventilation grill including intumescent material which operates to prevent the flow of smoke and/or flames for a significantly increased period of time, typically in excess of two hours.

According to the present invention in one aspect, there is provided a ventilator grill comprising a front panel formed with a plurality of ventilation openings and a rear panel formed over its entire surface with a plurality of discrete openings, lands between the ventilation openings of the front panel being coated or covered on their inner faces with intumescent material.

The intumescent material may be applied to all or only some of the lands. The intumescent material may be bonded to the lands by means of, for example, an adhesive, or may comprise a coating applied to the lands by a spray or brush.

In a preferred embodiment, the rear panel comprises a sheet of metallic wire mesh. In an alternative embodiment, the rear panel comprises a perforated metal plate.

The front and rear panels of the grill may be interconnected by any conventional means. Thus, for example, the front and rear panels may be positioned one to each side of a housing. A centrally mounted extraction fan may be positioned within the housing and between the front and rear panels. The wire mesh or perforated plate is typically retained behind a rim or lip formed around the adjoining surface of the housing. The mesh or perforated plate is typically produced from steel or aluminium.

In another aspect, the invention provides a ventilator grill which includes a front panel formed with a plurality of ventilation openings and a rear panel comprising a wire mesh sheet or a perforated plate, the front panel being at least partially covered or coated with an intumescent material which, when subjected to elevated temperatures, intumesces and rapidly expands completely to close off the openings of the front panel, the intumescent mass being retained in place by the presence of the rear panel.

The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a rear view of a front panel of a ventilator grill in accordance with the invention;

Figure 2 is a plan view of a rear panel of a ventilator in accordance with the invention; and

Figure 3 is a section in side view of an alternative ventilator grill in accordance with the invention.

As will be seen from Figure 1 of the drawings, the ventilator grill has a front panel 1 typically of steel or aluminium which is formed with a plurality of elongate openings 2 through which air can normally pass through a wall in which the grill is located. Positioned along the upper or lower margins of each ventilation opening is a piece of intumescent material 3. These intumescent pieces contain a material (e.g. graphite) which expands rapidly in the presence of heat to entirely close the ventilation openings 2. The intumescent pieces 3 may extend along the entire length of each ventilation opening 2 or a part thereof. Indeed, these pieces 3 may be positioned in a variety of ways, the criterion being that at elevated temperatures they rapidly expand completely to cover the entire rear face of the panel.

The use of intumescent material in the manner illustrated in Figure 1 is known. One problem with known ventilator grills is that the intumesced material quickly loses its integrity and becomes detached from the ventilator face thereby enabling smoke and flames to pass through the ventilator grill to an otherwise unaffected area.

In the present invention the grill includes a rear panel 5 as shown in Figure 2 formed of a steel or aluminium wire mesh 6. The rear panel is connected by any conventional means to the front panel 1. The rear panel 5 is normally spaced from the rear face of the front panel 1 by the thickness of the wall in which the ventilator grill is located. At elevated temperatures the mesh 6 operates to retain the expanded intumesced material in place thereby maintaining the effectiveness of the grill as a smoke and fire protector for a significantly increased period of time.

Tests have shown that grills in accordance with the invention are able to resist the passage of smoke or flames for periods in excess of two hours.

In the embodiment illustrated in Figure 3, the front panel 1 is extended rearwardly to define a casing 7 within which is mounted an extractor fan 9. In this embodiment, the entire casing 7 is filled with intumesced material in the event of a fire.

In operation, during normal use air flows from one side of the grill to the other through the openings 2 and the mesh 6. The grill is conventionally mounted within a wall

or panel with the front and rear panels flush with the surfaces of the wall in which it is mounted or set inwardly from these surfaces.

In the event of a fire, the resulting elevated temperature causes the intumescent pieces 3 to expand rapidly to cover entirely the rear face of the front panel and close off the openings 3. Ultimately, the entire space between the front and rear panels 1, 5 is filled. Smoke and/or flame is therefore prevented from passing through the grill.

The mesh 6 of the rear panel 5 holds the intumesced material in place thereby ensuring that the integrity of the intumesced mass is retained. This integrity retention significantly increases the fire and smoke worthiness of the grill. As mentioned previously, tests have shown that the integrity of the intumesced mass and therefore the fire and smoke effectiveness of the grill exceeds two hours.

It will be appreciated that the foregoing is merely exemplary of ventilator grills in accordance with the invention and that various modifications can readily be made thereto without departing from the true scope of the invention.

CLAIMS

1. A ventilator grill comprising a front panel formed with a plurality of ventilation openings and a rear panel formed over its entire surface with a plurality of discrete openings, lands between the ventilation openings of the front panel being coated or covered on their inner faces with intumescent material.
2. A grill as claimed in claim 1 wherein the intumescent material is applied to all of the lands.
3. A grill as claimed in claim 1 or claim 2 wherein the intumescent material is bonded to the lands by means of an adhesive.
4. A grill as claimed in claim 1 or claim 2 wherein the intumescent material comprises a coating applied to the lands by a spray or brush.
5. A grill as claimed in any one of the preceding claims wherein the rear panel comprises a sheet of metallic wire mesh.
6. A grill as claimed in any one of claims 1 to 4 wherein the rear panel comprises a perforated metal plate.
7. A ventilator grill which includes a front panel formed with a plurality of ventilation openings and a rear panel comprising a wire mesh sheet or a perforated plate, the front panel being at least partially covered or coated with an intumescent material which, when subjected to elevated temperatures, intumesces and rapidly expands completely to close off the openings of the front panel, the intumescent mass being retained in place by the presence of the rear panel.



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Claims searched: All

6 Examiner: Michael R. Wendt
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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): A5A (A22, A23)

Int Cl (Ed.7): A62C 2/06, 2/12, 2/14, 2/18, 2/24; F24F 13/

Other: Online: EPODOC, WPI, Japio

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2334675 A (KOVACS) e.g. see Figures 2 & 3; page 3 lines 13 etc.	
A	GB 2272836 A (E. - SEALS) e.g. see Claim 1; Figure 2.	
X	GB 2107182 A (DIXON) e.g. see Claim 1; page 2 lines 79 etc; Figures 7 & 8.	1, 5 & 7 at least.

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.